UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/848,411	05/04/2001	Daniel R. Jeske	Jeske 6-11/2925-0555P	7710

7590 02/15/2006	**EXAMINER**
Harnes, Dickey & Pierce, P.L.C. P.O. Box 8910 Reston, VA 20195	PERILLA, JASON M

ART UNIT	PAPER NUMBER
2638	

DATE MAILED: 02/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	09/848,411	JESKE ET AL.
	Examiner	Art Unit
	Jason M. Perilla	2638

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>14 December 2005</u>.
2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-18 and 20-24</u> is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☒ Claim(s) <u>15-17</u> is/are allowed.
6) ☒ Claim(s) <u>1-3,9,12-14 and 18</u> is/are rejected.
7) ☒ Claim(s) <u>4-8,10,11 and 20-24</u> is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on <u>26 November 2003</u> is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a) ☐ All   b) ☐ Some * c) ☐ None of:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____ .

DETAILED ACTION

1.   Claims 1-18, and 20-24 are pending in the instant application.

Response to Arguments/Amendments

2.   In view of the Applicant's remarks and amendments filed December 14, 2005,

the claim objections and rejections under 35 USC § 112, first paragraph, set forth in the

office action dated September 14, 2005 have been withdrawn.

3.   The Applicant's arguments against the prior art rejections of claims 1-3, 13, and

14 (see pages 8-9) as being anticipated by Dapper et al (US 59090650) have been

considered, but they are not persuasive.

The Applicant argues that Dapper does not disclose (1) a sample variance

estimate of a plurality of samples, (2) an *initial* SINR estimate, and (3) estimating a

signal-to-*interference*+noise ratio. However, the Examiner insists that, as broadly as

claimed, Dapper discloses all of the claimed limitations.

Regarding the "sample variance *estimate*", Dapper plainly discloses that

reference 30 of figure 2 is "*proportional*" to the variance of the noisy data samples 18

(col. 2, lines 47-50). Therefore, the determined sample variance is an estimated one

because it is proportional to the variance of the noisy data samples. It is not an exact

measure of variance but a proportionate or estimated one.

Regarding the generation of "an *initial* SINR estimate", the Examiner notes that

the method of Dapper creates only one SINR estimate. The output 38 of figure 2

represents the *initial* SINR estimate because there is no other SINR generation in the

method of Dapper. While the Applicant suggests that the SINR estimate 38 is not an

initial one because estimations are performed before the SINR is completed, such

estimations are ancillary to the generation of the one and only (initial) SINR estimate.

Regarding the estimation of a "signal-to-*interference*+noise ratio", as broadly as

claimed, Dapper's estimation of noise includes the estimation of interference because

the "noise" of Dapper is fairly interpreted to include interference which is a type of noise.

Furthermore, on page 2, the specification states, "[n]oise and interference are modeled

together as additive white Gaussian noise (AWGN)." Therefore, the noise+interference

of the instant application is simply white Gaussian noise.

4.   The Applicant's argument against the prior art rejection of claim 18 as being

anticipated by Buehrer et al (US 6614857; hereafter "Buehrer") has been considered,

but it is not persuasive.

The applicant contests that Buehrer fails to disclose combining the first and

second SINR estimates to produce a composite SINR estimate. Further, the Applicant

argues that the instant application claims a method of estimating a signal-to-

interference+noise ratio rather than a signal-to-noise ratio as disclosed by Buehrer.

However, the Examiner insists that all of limitations of the claim are disclosed by

Buehrer. Buehrer discloses (col. 4, lines 48-56):

> One approach to setting δ is to use a value of δ which reflects the SNR of the two
> signals used for estimation, i.e.,
>
> $$\delta = \frac{\gamma_p}{\gamma_p + \gamma_s} \quad \textbf{(C)}$$
>
> **where γ_p is the SNR of the pilot signal (A) and γ_s is the SNR of the data (B).**

Therefore, according to Buehrer, both a first SINR estimate (A) is generated

based on pilot samples and a second SINR estimate (B) is generated based on

data samples. Further, as broadly as claimed, the first and second estimates are

"combined" according to the equation (C). That is, δ represents the combination

of the first and second SINR estimates. Indeed, as broadly as claimed, the ratio

of the first and second SINR estimates of Buehrer described by equation (C)

represents a combination of them.

Further, the signal-to-noise ratios of the pilot signal and data signal of

Buehrer are considered to be equivalent to the signal-to-interference+noise ratios

of claim 18 because the "interference" is not specified as having a particular

form. That is, the signal-to-noise ratios of Buehrer, as understood by one in the

art, include noise from all sources. The "noise" in the general "signal-to-noise

ratio" described by Buehrer is appropriately interpreted to encompass white,

Gaussian, or ambient noise as well as any noise from interfering frequencies and

signals. The "noise" of Buehrer is considered to be anything other than the

signal. Therefore, it encompasses "noise" and "interference" as broadly as

claimed.

Claim Rejections - 35 USC § 102

5.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6.   Claims 1-3, 13, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated

by Dapper et al (US 5809065; hereafter "Dapper" - previously cited)

Regarding claim 1, Dapper discloses according to figure 2 a method of

estimating a signal-to-interference+noise ratio (SINR), comprising: generating an initial

SINR estimate (38) based on a mean (36) of a plurality of samples (34; col. 2, lines 52-

55 and 58-60) and a sample variance estimate (30) of the plurality of samples (28; col.

2, lines 47-49); scaling the initial SINR estimate (40) by applying it to a threshold; and

translating (42) the scaled SINR estimate by applying it to a translating switch. As

broadly as claimed, the scaling is considered to be a comparison with a threshold and

the translating is the conversion by a switch.

Regarding claim 2, Dapper discloses the limitations of claim 1 as applied above.

Further, Dapper discloses that the generating step generates the initial SINR estimate

based on at least two sample variance estimates or that the sample variance estimate is

based on at least two samples (col. 2, lines 43-50).

Regarding claim 3, Dapper discloses the limitations of claim 2 as applied above.

Further, Dapper discloses that the generating step generates a smoothed or averaged

sampled variance estimate (fig. 2, ref. 28) based on the at least two sample variance

estimates, and generates the initial SINR estimate (38) based on the smoothed sample

variance estimate.

Regarding claim 13, Dapper discloses the limitations of claim 1 as applied above. Further, Dapper discloses, as broadly as claimed, that the plurality of samples (fig. 2, refs. 18 and 22) are pilot symbol samples or samples used to determine the signal to noise ratio.

Regarding claim 14, Dapper discloses the limitations of claim 1 as applied above. Further, Dapper discloses that the plurality of samples (fig. 2, refs. 18 and 22) are data symbol samples (col. 2, lines 35 and 42-44).

7.   Claim 18 is rejected under 35 U.S.C. 102(e) as being anticipated by Buehrer et al (US 6614857; hereafter "Buehrer" – previously cited).

Regarding claim 18, Buehrer discloses a method of estimating a signal-to-inteference+noise ratio (SINR), comprising: generating a first SINR or SNR estimate (γ_p) based on received pilot symbol samples (col. 4, lines 54-56); generating a second SINR estimate (γ_s) based on received data symbol samples (col. 4, lines 54-56); and combining the first and second SINR estimates to produce a composite SINR estimate (col. 4, line 50; equation 7). The generation of the SNR of the pilot signal and the SNR of the data signal is certain because the values are known by the method of Buehrer, and, as broadly as claimed, the combining result (δ) is disclosed in equation 7 as the division of the pilot SNR by the sum of the pilot SNR and the data SNR. Further, Buehrer discloses that the combining includes weighting, by a variable Tp, the first SINR estimate (col. 4, eq. 8) and weighting, by a variable Ts, the second SINR estimate (col. 4, eq. 9). According to Buehrer, the ratio of the pilot filter bandwidth (col. 5, line 15)

is utilized to "weight' each of the pilot SINR (γ_p; col. 4, eq. 8) and the data SINR (γ_s; col.

4, eq. 9) before they are combined (col. 4, eq. 7).

Allowable Subject Matter

8.   Claims 15-17 are indicated to contain allowable subject matter in view of the prior

art of record.

9.   Claims 4-8, 10, 11, and 20-24 are objected to as being dependent upon a

rejected base claim, but would be allowable in view of the prior art of record if rewritten

in independent form including all of the limitations of the base claim and any intervening

claims.

Conclusion

10.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

11.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Jason M. Perilla whose telephone number is (571) 272-

3055. The Applicant is requested to contact the Examiner to discuss allowable subject matter in the case before a response to this office action is filed. The Examiner can normally be reached on M-F 8-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh M. Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jason M. Perilla
February 13, 2006

jmp

CHIEH M. FAN
SUPERVISORY PATENT EXAMINER